PROJECT GALILEO: FROM GANYMEDE BACK TO IO

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Galileo has now completed two years of the Galileo Millennium Mission and the spacecraft continues to gather new and exciting observations of the Jupiter system. In late December, 2000, Galileo teamed with Cassini in the first ever collaboration between two missions to simultaneously study an outer planet and its surrounding environment. The unique opportunity of having two very capable spacecraft perform complementary observations is yielding new insights into the interactions of the solar wind with the magnetosphere, the atmospheric dynamics of Jupiter, the rings, and the tenuous atmospheres of Ganymede and Io. While Galileo provided high-resolution remote sensing observations during its Ganymede 29 encounter, Cassini acquired large-scale contextual views. Both spacecraft observed magnetospheric bow shock crossings and the same high velocity dust stream originating from the vicinity of Io. Following the successful Io encounters in late 1999, the Galileo mission was specifically designed to reduce radiation damage by keeping the spacecraft outside the intense radiation environment close to Jupiter with the goal of being operational when Cassini flew by en route to Saturn. Following Ganymede 29, the focus of the mission shifted back to Io as the spacecraft performed a gravity assist at Callisto to set up Io flyby geometries enabling definitive observations of that moon's magnetic field.

For a 14 week period around the Ganymede 29 perijove passage, Galileo collected continuous fields and particles data providing a complete slice from the solar wind through the magnetosphere and back out again. Collection of this data set required a new level of sequence design complexity to integrate real-time and recorded data acquisition with concurrent data playback

Significant engineering issues and future plans are described. Each passage close to Jupiter brings new challenges to spacecraft operations as the cumulative radiation dosage approaches three and a half times the design limits. Engineering data on spacecraft and instrument performance in this harsh environment is very useful to designers of future missions to Jupiter and its moons.

Science results which continue to change our fundamental understanding of the Jupiter system, particularly the jovian magnetosphere and magnetic fields of the satellites, are also presented.

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